**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Attorney Docket No. 6144.10

In re Application for Reissue
of U.S. Patent No. 5,684,289

Paul O. Detwiler et al. Art Unit: Unassigned

Serial No. Examiner: Unassigned

Filed: MAR 2 3 2001

For: **OPTICAL SCANNER HAVING ENHANCED ITEM SIDE COVERAGE**

Asst. Commissioner for Patents

Washington, D.C. 20231

**PRELIMINARY AMENDMENT**

Sir:

Please enter the following Preliminary Amendment and Remarks:

**IN THE CLAIMS**

Please add new claims 36-58 as follows:

36. An optical scanner comprising:

a housing having a substantially vertical surface containing a first aperture and a substantially horizontal surface containing a second aperture;

a single laser which produces a laser beam within the housing;

a plurality of groups of pattern mirrors;

a polygon spinner having mirrored facets receiving the laser beam and rotating to reflect the laser beam in a plurality of directions as the spinner rotates,

the reflected laser beam striking the pattern mirrors to produce a plurality of scanning beams including a first group of scanning beams, a second group of scanning beams, and a third group of scanning beams;

a first group of pattern mirrors reflecting the first group of scanning beams through the first aperture to produce a first scan pattern consisting of a plurality of intersecting scan lines and for reflecting the second group of scanning beams through the first aperture to produce a second scan pattern consisting of a plurality of intersecting scan lines;

a second group of pattern mirrors reflecting the third group of scanning beams through the second aperture to produce a third scan pattern consisting of a plurality of intersecting scan lines; and

the reflected laser beam from the spinner alternatingly striking at least one pattern mirror of the first group and then at least one pattern mirror of the second group, and repeating this alternating operation multiple times as the beam is reflected from a single facet of the spinner during a single rotation of the spinner, to reflect scanning

beams alternatingly and repetitively through the first and second apertures as the spinner rotates a single rotation.

37. An optical scanner comprising:

a housing having a substantially vertical surface containing a first aperture and a substantially horizontal surface containing a second aperture;

a single laser which produces a laser beam within the housing;

a plurality of groups of pattern mirrors;

a polygon spinner having mirrored facets receiving the laser beam and rotating to reflect the laser beam in a plurality of directions as the spinner rotates, to cause the beam to strike the pattern mirrors to produce a plurality of scanning beams including a first group of scanning beams, a second group of scanning beams, and a third group of scanning beams;

a first group of pattern mirrors reflecting the first group of scanning beams through the first aperture to produce a first scan pattern consisting of a plurality of intersecting scan lines and for reflecting the second group of scanning beams through the first aperture to produce a second scan pattern consisting of a plurality of intersecting scan lines; and

a second group of pattern mirrors reflecting the third group of scanning beams through the second aperture to produce a third scan pattern consisting of a plurality of intersecting scan lines;

the first group of pattern mirrors including a plurality of pattern mirrors spaced apart from one another and located between the polygon spinner and the second group of pattern mirrors, and

the polygon spinner directing the laser beam alternatingly at the pattern mirrors of the first group that are spaced apart and through the spaces between those pattern mirrors to reach the pattern mirrors of the second group as the polygon spinner rotates.

38. An optical scanner as in claim 37, wherein:

the pattern mirrors of the first group that are spaced apart reflect the beams to other pattern mirrors and then through the first aperture.

39. An optical scanner comprising:

a housing having a substantially vertical surface containing a first aperture and a substantially horizontal surface containing a second aperture;

a single laser which produces a laser beam within the housing;

a plurality of groups of pattern mirrors;

a polygon spinner having mirrored facets receiving the laser beam and rotating to reflect the laser beam in a plurality of directions as the spinner rotates to cause the beam to strike at least certain of the pattern mirrors to produce a plurality of scanning beams including a first group of scanning beams, a second group of scanning beams, and a third group of scanning beams;

a first group of pattern mirrors for reflecting the first group of scanning beams through the first aperture to produce a first scan pattern consisting of a plurality of intersecting scan lines and for reflecting the second group of scanning beams through the first aperture to produce a second scan pattern consisting of a plurality of intersecting scan lines; and

a second group of pattern mirrors for reflecting the third group of scanning beams through the second aperture to produce a third scan pattern consisting of a plurality of intersecting scan lines;

wherein each facet of the polygon spinner directs the laser beam alternatingly multiple times, during each rotation of the polygon spinner, to at least one pattern mirror of the first group and then to at least one pattern mirror of the second group, to reflect the laser beam

alternatingly through the first and second apertures multiple times as the polygon spinner rotates a single rotation.

40. An optical scanner for scanning at least the top, bottom and three sides of an article comprising:

a housing having a substantially vertical surface containing a first aperture and a substantially horizontal surface containing a second aperture;

a single laser which produces a laser beam within the housing;

a plurality of groups of pattern mirrors;

a polygon spinner having mirrored facets receiving the laser beam and rotating to reflect the laser beam to produce a single reflected beam directed in a plurality of directions as the spinner rotates, to produce a plurality of scanning beams including a first group of scanning beams, a second group of scanning beams, and a third group of scanning beams; and

a first group of pattern mirrors reflecting the first group of scanning beams through the first aperture to produce a first scan pattern consisting of a plurality of intersecting scan lines and for reflecting the second group of scanning beams through the first aperture to produce a second scan pattern consisting of a plurality of intersecting scan lines;

the first group of pattern mirrors including mirrors positioned adjacent to first aperture, at least one of which is angled to reflect scanning beams of the first group outwardly and downwardly to scan the top of an article, and other mirrors angled to reflect scanning beams of the second group diagonally laterally and downwardly to scan the leading and trailing sides of the article; and

a second group of pattern mirrors reflecting the third group of scanning beams through the second aperture to produce a third scan pattern consisting of a plurality of intersecting scan lines;

the first group of pattern mirrors including a plurality of pattern mirrors spaced apart from one another and located between the polygon spinner and the second group of pattern mirrors.

41. An optical scanner comprising:

a housing having a substantially vertical surface containing a first aperture and a substantially horizontal surface containing a second aperture;

a single laser which produces a laser beam within the housing;

a plurality of groups of pattern mirrors;

a polygon spinner having mirrored facets for reflecting the laser beam to produce a single reflected beam

in a plurality of directions as the spinner rotates to cause the beam to strike at least some of the pattern mirrors, to produce a plurality of scanning beams including a first group of scanning beams, a second group of scanning beams, and a third group of scanning beams; and

a first group of pattern mirrors including a first, second and third subsets of pattern mirrors for reflecting the first group of scanning beams through the first aperture to produce a first scan pattern consisting of a plurality of intersecting scan lines,

a second group of pattern mirrors including a first, second and third subsets of pattern mirrors reflecting the second group of scanning beams through the first aperture to produce a second scan pattern consisting of a plurality of intersecting scan lines; and

a third group of pattern mirrors for reflecting the third group of scanning beams through the second aperture to produce a third scan pattern consisting of a plurality of intersecting scan lines;

the first group of scanning beams reflecting off multiple mirrors of the first subset of pattern mirrors of the first group to the second subset thereof, then reflecting off multiple mirrors of said second subset to the third subset thereof, and then off at least one mirror of said third subset out the first aperture,

the second group of scanning beams reflecting off multiple mirrors of the first subset of pattern mirrors of the first group to the second subset thereof, then reflecting off multiple mirrors of said second subset to the third subset thereof, and then off at least one mirror of said third subset out the first aperture.

42. An optical scanner as in claim 41, wherein

the third subset of mirrors in the second group includes multiple mirrors and the scanning beams from the second subset of the second group reflect off multiple mirrors of the second group and then pass out the first aperture.

43. An optical scanner comprising:

a housing having a substantially vertical surface containing a first aperture and a substantially horizontal surface containing a second aperture;

a single laser which produces a laser beam within the housing;

a plurality of groups of pattern mirrors;

a polygon spinner having mirrored facets for reflecting the laser beam in a plurality of directions as the spinner rotates to produce a plurality of scanning beams including a first group of scanning beams, a second group of scanning beams, and a third group of scanning beams; and

a first group of pattern mirrors including a first, second and third subsets of pattern mirrors for reflecting the first group of scanning beams through the first aperture to produce a first scan pattern consisting of a plurality of intersecting scan lines,

a second group of pattern mirrors including a first, second and third subsets of pattern mirrors reflecting the second group of scanning beams through the first aperture to produce a second scan pattern consisting of a plurality of intersecting scan lines; and

a third group of pattern mirrors for reflecting the third group of scanning beams through the second aperture to produce a third scan pattern consisting of a plurality of intersecting scan lines;

the first group of scanning beams reflecting off the first subset of pattern mirrors of the first group to the second subset thereof, then reflecting off said second subset to the third subset thereof, and then off said third subset out the first aperture,

the second group of scanning beams reflecting off the first subset of pattern mirrors of the first group to the second subset thereof, then reflecting off said second subset to the third subset thereof, and then off said third subset out the first aperture,

at least one of the mirrors of the first group of pattern mirrors being positioned adjacent the first aperture to reflect certain of the first group of scanning beams outwardly through the first aperture to scan the side of an article,

at least one of the mirror of the first group of pattern mirrors being positioned adjacent the first aperture and angled to reflect certain of the first group of scanning beams outwardly and laterally through the first aperture toward the front of the article, and at least one positioned adjacent the first aperture and angled to reflect certain of the first group of scanning beams outward and laterally through the first aperture to scan the rear of the article, and

at least one of the mirrors of the first group of pattern mirrors being positioned adjacent the first aperture and angled to reflect certain of the first group of scanning beams downwardly and outwardly through the first aperture to scan the top of an article.

44. An optical scanner comprising:

a housing having a substantially vertical surface containing a first aperture and a substantially horizontal surface containing a second aperture;

a single laser which produces a laser beam within the housing;

a plurality of pattern mirrors, including a plurality of groups of pattern mirrors;

a polygon spinner having mirrored facets receiving the laser beam and rotating to reflect the laser beam to produce a single reflected beam directed in a plurality of directions as the spinner rotates, the reflected beam striking the pattern mirrors to produce a plurality of scanning beams, including a first group of scanning beams, a second group of scanning beams, and a third group of scanning beams; and

a first group of pattern mirrors reflecting the first group of scanning beams through the first aperture to produce a first scan pattern consisting of a plurality of intersecting scan lines and for reflecting the second group of scanning beams through the first aperture to produce a second scan pattern consisting of a plurality of intersecting scan lines; and

a second group of pattern mirrors reflecting the third group of scanning beams through the second aperture to produce a third scan pattern consisting of a plurality of intersecting scan lines;

the first group of pattern mirrors include a plurality of mirrors, at least one of which is positioned and angled to reflect incident laser beams outwardly to scan the

side of an article, at least a second of which is positioned and angled to reflect incident laser beams downward toward the top of an article, at least a third mirror of which is positioned and angled to reflect an incident laser downwardly and rearwardly to scan the leading edge of an article, and at least a fourth of which is positioned and angled to reflect an incident beam downwardly and forwardly to scan the trailing edge of an article.

45. An optical scanner as in claim 9 wherein:

the second group of pattern mirrors includes at least one mirror positioned and angled to reflect an incident beam in a substantially vertical direction to scan the bottom of the article and at least one mirror is positioned and angled to reflect an incident beam rearwardly to scan the forward side of the article.

Based on Claim 18 (Count 1)

46. A method of scanning an item having a bar code from multiple directions, comprising the steps of

generating laser light;

providing a single multi-faceted mirrored polygon in a path of said laser light;

rotating the mirror polygon and directing the laser light at the polygon, as it is rotating, to produce a laser beam reflected off each facet of the polygon;

generating a first group of scanning beams, a second group of scanning beams, and a third group of scanning beams by reflecting said laser light off said mirror polygon and then reflecting the laser light off groups of pattern mirrors;

generating the first group of scanning beams comprises directing the laser beam to a first set of pattern mirrors, reflecting the beam from those mirrors to a second set of pattern mirrors and reflecting the beam from those mirrors to at least one additional pattern mirror;

directing said first group of scanning beams from said at least one additional mirror through a first transparent member oriented in a first plane to scan a surface of the item from one orthogonal direction to scan at least the top of an item;

generating the second plurality of scanning beams comprises directing the laser beam to a third set of pattern mirrors, reflecting the beam from those mirrors to a fourth set of pattern mirrors and reflecting the beam from those mirrors to a fifth set of pattern mirrors;

directing said second group of scanning beams from at least one mirror of said fifth set of mirrors directly outwardly through the first transparent member oriented in the first plane to scan one side of the item and from further mirrors of said fifth set of mirrors diagonally outwardly through the first transparent member oriented in the first plane to scan the item from a diagonal direction to scan the front and rear sides of the item; and

generating the third plurality of scanning beams comprises directing the single laser beam to a sixth set of pattern mirrors, reflecting the beam from those mirrors to a seventh set of pattern mirrors and reflecting the beam from the mirrors of the seventh set,

directing said third group of scanning beams from said seventh set of mirrors through a second transparent member oriented in a second plane orthogonal to said first plane to scan the item from another orthogonal direction to scan at least the bottom of the item.

47. A method of scanning as in Claim 46 wherein

the first group of scanning beams is directed through the first transparent window in an outwardly and downwardly direction to scan the top of an item, and

the second group of scanning beams is directed through the first transparent window in at least a diagonally rearward direction and a diagonally forward direction to scan the front and rear sides of an item.

48. A method of scanning as in claim 47 wherein

certain of the beams of the second group are directed through the first transparent window in a diagonally rearward direction to scan the front of an item, other beams of the second group are directed through the first transparent window in a diagonally forward direction to scan the back of an item and other beams of the second group are directed outwardly through the first transparent window in a generally lateral direction to scan the side of the item.

49. A method of scanning as in claim 46 where

at least certain of the third group of scanning beams is generated by directing the beam from the polygon between mirrors of the first set to the mirrors of the sixth set.

50. A method of scanning as in claim 46 wherein

scanning beams are directed through the first transparent window and through the second transparent window

alternatingly, and this alternative operation occurs repeatedly, for beams originating from a single facet of the polygon, during each rotation of the polygon.

51. A method of scanning as in claim 46 wherein

generating laser light comprises

generating a single laser beam, and only said single laser beam is reflected off each of the facets of the polygon.

52. A method of scanning an item having a bar code from multiple directions, comprising the steps of

generating laser light in the form of a single laser beam;

providing a single multi-faceted mirrored polygon in a path of said single laser light beam;

rotating the mirror polygon and reflecting the single laser beam from each of the facets of the polygon, as the polygon is rotating, to form from the single laser beam a plurality of scanning beams that pass through both horizontal and vertical transparent members;

generating a first group of scanning beams, a second group of scanning beams, and a third group of scanning beams by reflecting said laser beam off said mirror polygon and then off groups of pattern mirrors;

generating the first group of scanning beams comprises directing the laser beam to a first set of pattern mirrors, reflecting the beam from those mirrors to a second set of pattern mirrors and reflecting the beam from those mirrors to at least one additional pattern mirror;

directing said first group of scanning beams from said at least one additional mirror through a vertical transparent member oriented in a first plane to scan a surface of the item from one orthogonal direction;

generating the second plurality of scanning beams comprises directing the laser beam to a third set of pattern mirrors, reflecting the beam from those mirrors to a fourth set of pattern mirrors and reflecting the beam from those mirrors to at least one further mirror;

directing said second group of scanning beams from said at least one further mirror through the vertical transparent member oriented in the first plane to scan the item from a diagonal direction to scan at least one side of the item; and

generating the third plurality of scanning beams comprises directing the laser beam to a fifth set of pattern mirrors, reflecting the beam from those mirrors to a sixth set of pattern mirrors and reflecting the beam from the mirrors of the sixth set,

directing said third group of scanning beams from said sixth set of mirrors through a horizontal transparent member oriented in a second plane orthogonal to said first plane to scan the item from another orthogonal direction.

53. A method of scanning as in Claim 52 wherein

the first group of scanning beams is directed through the first transparent window in an outwardly and downwardly direction to scan the top of an item, and

the second group of scanning beams is directed through the first transparent window in a diagonally rearward direction to scan the front of an item.

54. A method of scanning as in claim 53 wherein

certain of the beams of the second group are directed through the first transparent window in a diagonally rearward direction to scan the front of an item, and other beams of the second group are directed through the first transparent window in a diagonally forward direction to scan the back of an item.

55. A scanner as in claim 52 wherein

scan lines are directed through the first transparent window and through the second transparent window

alternatingly, and this alternative operation occurs repeatedly, for beams originating from a single facet of the polygon, during each rotation of the polygon.

56. An optical scanner comprising:

a housing having a substantially vertical surface containing a first aperture and a substantially horizontal surface containing a second aperture;

a single laser which produces a laser beam within the housing;

a plurality of groups of pattern mirrors;

a polygon spinner having mirrored facets receiving the laser beam and rotating to reflect the laser beam in a plurality of directions as the spinner rotates,

the reflected laser beam striking the pattern mirrors to produce a plurality of scanning beams including a first group of scanning beams, a second group of scanning beams, and a third group of scanning beams;

a first group of pattern mirrors reflecting the first group of scanning beams through the first aperture to produce a first scan pattern consisting of a plurality of intersecting scan lines and for reflecting the second group of scanning beams through the first aperture to produce a second scan pattern consisting of a plurality of intersecting scan lines;

a second group of pattern mirrors reflecting the third group of scanning beams through the second aperture to produce a third scan pattern consisting of a plurality of intersecting scan lines; and

the polygon spinner having four facets, two of the facets being angled at angles closer to their respective opposite facets than to their two adjacent facets, and

the beam from one pair of opposite facets of the polygon spinner striking one set of mirrors of the first group, and the beam from the other pair of opposite facets striking a different set of mirrors of the first group.

57. An optical scanner as in claim 56 comprising

a single laser which produces a single laser beam, and

a polygon spinner that receives just the single laser beam.

58. A method of scanning an item having a bar code from multiple directions, comprising the steps of

generating laser light;

providing a single multi-faceted mirrored polygon in a path of said laser light;

constructing the mirrored polygon to have four facets, two of the facets being angled at angles closer to their respective opposite facets than to their two adjacent facets,

rotating the mirrored polygon and directing the laser light at the polygon, as it is rotating, to produce a laser beam reflected off each facet of the polygon;

generating a first group of scanning beams, a second group of scanning beams, and a third group of scanning beams by reflecting said laser light off said mirrored polygon and then reflecting the laser light off groups of pattern mirrors;

generating the first group of scanning beams comprises directing the laser beam from one pair of opposite facets of the mirrored polygon to a first set of pattern mirrors,

directing said first group of scanning beams from the first set of pattern mirrors through a first transparent member oriented in a first plane to scan a surface of the item from one orthogonal direction;

generating the second plurality of scanning beams comprises directing the laser beam from the second pair of opposite facets of the mirrored polygon to a second set of pattern mirrors,

directing said second group of scanning beams from the second set of pattern mirrors through the first transparent member oriented in the first plane to scan the item from a diagonal direction;

generating the third plurality of scanning beams comprises directing the single laser beam to a third set of pattern mirrors, and

directing said third group of scanning beams from said third set of pattern mirrors through a second transparent member oriented in a second plane orthogonal to said first plane to scan the item from another orthogonal direction.

**COMMENTS**

This will advise the Examiner that patent 5,684,289, for which a reissue patent is being sought, is involved in a two-party interference proceeding entitled Detwiler v. Bobba Interference No. 104,631. The interference involves claims 1 to 21 and 33 to 35 of the '289 patent.

The Bobba application in this interference is a continuation of Bobba U.S. patent 5,475,207. One of the issues that we understand will be raised in the interference is the validity of some or all of the '289 patent claims in view of a Spectra Physics "Magellan" bar code scanner that is

very similar to the scanner shown in Fig. 21 of the Bobba '207 patent.

Respectfully submitted,

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MAR 2 3 2001

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